**Threats to Forests**

During the lifetime of forest stands they are subject to many different factors that can potentially threaten their very existence. Abiotic factors such as windthrow and fires can devastate forests while biotic factors such as insect pests, diseases and animal damage can seriously affect their  health and productivity. The protection of forests is therefore one of the  key objectives of forest management in order to maintain the sustainability of the forest resource. This section outlines the common threats that impact on Ireland’s forests and the measures that are taken to avoid them.

**Wind throw**

Ireland being an island on the edge of the Atlantic Ocean experiences some of the windiest and wettest weather in Europe. Irish forests are regularly subjected to high winds and when these are accompanied by heavy rainfall they pose a real threat to the stability of forest stands. Windthrow, of all the potential damaging agents, is perhaps the greatest threat to forests and economic forestry in this country.

Windthrow affects plantations at nearly all stages, from the later establishment stage through to the pole stage and mature high forest.

**YOUNG STANDS**

Some species which have rapid early growth such as lodgepole pine, Douglas fir, larches, ash and sycamore produce large crowns in relation to their root systems. As a result, they are vulnerable to toppling in high winds before their roots systems are extensive enough to provide good stability.  Poor planting practice where the roots are badly deformed can compound this effect.

Once toppled, trees attempt to grow upright and in doing so the main stem develops a curve in the lower section known as basal sweep. This causes difficulties in harvesting; and also, as the lower section is the most valuable part of the tree, the timber value of a crop can be significantly reduced.

**OLDER STANDS**

In the later stages of a crop, windthrow can lead to increased harvesting costs due to difficulties in harvesting flattened and tangled trees. Also, shattering and breakage reduces the timber quality and therefore the value of the material harvested.  Windthrow often requires shortening rotations resulting in stands being clearfelled well in advance of the economic rotation length.

There are two types of windthrow in older stands:

* ***Insipient windthrow*** – this is gradual windthrow that can occur at the edges of a stand or breaks in the canopy. It is often local to a stand and occurs over a period of years. On vulnerable sites the crop is often left to mature without thinning.
* ***Catastrophic windthrow*** – This type of windthrow usually occurs over large areas of forest and as the name implies has a major effect on the forest landscape. Periodically Ireland experiences severe storms, usually the tail end of hurricanes that sweep in from the Atlantic. These occur irregularly but can be expected at 10-15 year intervals. Extensive damage is caused by these storms such as the storm of 1974.

Large volumes of blown timber cause huge logistical difficulties for both the forest and the mill manager as harvested timber can degrade in time unless processed. This is particularly the case with pines and storage under sprinklers is often used to prevent the timber drying out or becoming infected by the blue stain fungus which discolours the wood.

**MITIGATION**

While little can be done to avoid catastrophic windthrow there are a number of ways in which forester can reduce the risk of forest stands being blown:

* Cultivation and drainage – using an appropriate cultivation technique for the soil and site conditions and ensuring that drainage will lower the watertable sufficiently to provide adequate rooting depth.
* Planting stock and planting – ensuring that planting stock has good fibrous root systems and that these are not badly deformed during the planting operation.
* Thinning – careful thinning on wet and exposed sites or, employing a no-thin regime on sites vulnerable to windthrow.
* Clearfelling stands to windfirm edges where the trees have become more adapted to exposed conditions.
* Roading – avoiding excessive openings for roads, entrances and turning points.

**Forest Fires**

Ireland is fortunate in not experiencing the large scale devastating forest fires that are common in drier regions. The mild moist climate with rainfall throughout the year ensures that prolonged droughts are a very rare. While crown fires in mature forests seldom happens, young plantations are vulnerable to fire especially during late spring and early summer when dead ground vegetation built up during the previous season begins to dry out. The practice of burning gorse and heather on hills to provide new growth for livestock is a major threat to forests. These fires can often get out of control, particularly during dry and windy weather, and enter plantations. Approximately 450 ha of forest are lost to fire each year in the period from February to September with the vast majority occurring in March, April and May.

A number of measures are taken by foresters to prevent fire damage in forests including:

* Fires plans – These are contingency plans in the event of an outbreak detailing  access routes, location of firefighting equipment , water sources, procedures in contacting fire brigades, helicopter services, Gardai, personnel to assist in putting out the fire etc.
* Fire Weather Index – produced by Met Éireann, this assesses the fire risk in an area taking into account current and past weather conditions. It also uses forecast weather information to produce a forecast index for five days ahead.
* Fire lines – creating vegetation free line of approx 5-6 metres in width around the outer edge of a plantation to prevent the entry of ground fires.
* Water reservoirs – locating reservoirs at strategic points in larger forests to supply water when no suitable local sources are available.
* Planting of larch which due to its light crown can prevent the spread fire in conifer stands.

Loosing a plantation to fire has financial consequences for the owner, however, it is possible to insure plantations against fire and reconstitution grants for replanting are available from the Forest Service.  While these will help to recoup some of the initial investment lost, the owner must start again and they will not make up for the time lost.